$4 NaO + 2H_2$

$2Na_2O_2 + 2H_2O \rightarrow 4NaOH + O$

$2H + H_2SO_4$

$2H_2O + SO_2.$

HIGH SCHOOL AND UNIVERSITY
MATRICULATION EXAMINATIONS BOARD.

DEPARTMENTAL EXAMINATIONS, 1927.

CHEMISTRY 1.

Time—Three hours.

Values.

3 **1.** (*a*) Distinguish clearly between a mixture and a chemical compound.

2 (*b*) State *one* example of chemical action resulting in decomposition and *one* resulting in chemical union.

2 (*c*) Define and give an example of a *pure* substance.

6 **2.** (*a*) Describe, using a diagram, an experiment to show the preparation and collection of oxygen from sodium peroxide and water.

1 (*b*) How could you show that the gas given off was oxygen?

(*c*) Continue the experiment until all the sodium peroxide is changed. Then carefully evaporate to dryness the substance remaining in the flask.

2 (1) Write the equation for the reaction in (*a*).

1 (2) State *one* of the important properties of the substance obtained in (*c*).

2 **3.** (*a*) Explain what happens when concentrated sulphuric acid is left exposed to the air.

4 (*b*) Explain what is meant by water of crystallization. Give *two* distinct examples.

4 (*c*) Show how to make saturated and supersaturated solutions, respectively, of sodium thiosulphate.

4. In water 100 g. oxygen combine with 12.59 g. hydrogen.

In hydrogen peroxide 100 g. of oxygen unite with 6.25 g. hydrogen.

In ethane 100 g. carbon combine with 25 g. hydrogen.

CURRICULUM
LB
3054
C2
D419
1927
exam.2
CURR HIST

Values.

In methane 100 g. carbon combine with 33.3 g. hydrogen.

In cuprous oxide 100 g. copper combine with 12.57 g. oxygen.

In cupric oxide 100 g. copper combine with 25.15 g. oxygen.

3 (*a*) State the conclusion you might make from the above experimental results.

2 (*b*) State the law of combining weights

4 (*c*) If 53 g. magnesium when burned in air form 88 g. of magnesium oxide, find the combining weight of magnesium if that of oxygen is 16.

6 **5.** (*a*) Describe, using a diagram, the Frasch method of mining sulphur.

(*b*) Write equations expressing the chemical changes which take place in the following experiments:

2 (1) A lighted taper is applied to the end of a tube from which hydrogen sulphide is issuing. $2H_2S + 3O_2 \rightarrow 2SO_2 + 2H_2O$.

2 (2) Chlorine gas is passed into a jar containing hydrogen sulphide. $H_2S + Cl_2 \rightarrow 2HCl + S$

3 (3) Copper clippings and strong sulphuric acid are heated together in a flask. $H_2SO_4 + Cu$ [illegible]

$H_2SO_4 \cdot 2H \rightarrow$ [illegible]

3 **6.** (*a*) State Dalton's atomic theory.

2 (*b*) Show how the theory referred to in (*a*) explains the law of definite proportions.

10 (*c*) Write molecular formulae for the following:

(1) The oxide of silver, of copper and of carbon.

(2) The sulphate of sodium, of magnesium and of iron.

(3) The carbonate of lead, of potassium, of zinc and of calcium.

1 **7.** (*a*) Define an anhydride.

4 (*b*) Write molecular formulae for the anhydrides of nitric acid, sulphuric acid, phosphoric acid and sulphurous acid.

(*c*) Hydrochloric acid is added slowly to a small quantity of magnesium oxide until all the oxide is dissolved; the resulting substance is evaporated to dryness.

2 (1) Write the equation for the reaction.

1 (2) Name the substance left in the evaporating dish.

Values.

1 (3) How would you describe the effect of the magnesium oxide on the hydrochloric acid?

1 (4) If just enough hydrochloric acid were added to completely dissolve the magnesium oxide, what effect would the resulting substance have on litmus paper?

6 **8.** (*a*) Describe, using a diagram, a laboratory method for the preparation and collection of chlorine.

2 (*b*) Write the equation for the reaction involved in (*a*).

3 (*c*) State what you would observe and the conclusion you would draw from the following experiment:

A small piece of clean yellow phosphorus is placed in a deflagrating spoon and lowered into a jar of chlorine.

2 (*d*) State *two* important economic uses of chlorine.

7 **9.** (*a*) Describe, using a diagram, the method of manufacturing nitric acid from the air.

6 (*b*) Write *three* equations explaining the reactions involved in (*a*).

100

Ex libris
Universitatis
Albertaensis

QUAECUMQUE VERA

$Cu + 2H_2SO_4 \rightarrow CuSO_4 + 2H_2O + SO_2$

John E.